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The Formation of Multiple-Unit Business Groups by Japanese Companies and the Governance of Subsidiaries

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ABSTRACT

Given the ongoing efforts of Japanese companies to diversify and globalize their operations and launch multiple-unit corporate business groups, these firms are finding it increasingly important to govern their subsidiaries properly. This paper analyzes the current state of the formation of corporate business groups. The effect of the parent company's granting of stock options to subsidiaries' executives is also empirically examined using the technique of propensity score matching. The empirical results show that the granting of stock options by the parent company to these executives had a positive impact on the business group's performance. This result suggests that in order to improve parent-subsidiary managerial relations, it is important to provide subsidiaries with incentives that will encourage them to improve the business performance of the group as a whole.

Keywords: Corporate group, Corporate governance, Incentives, Stock option

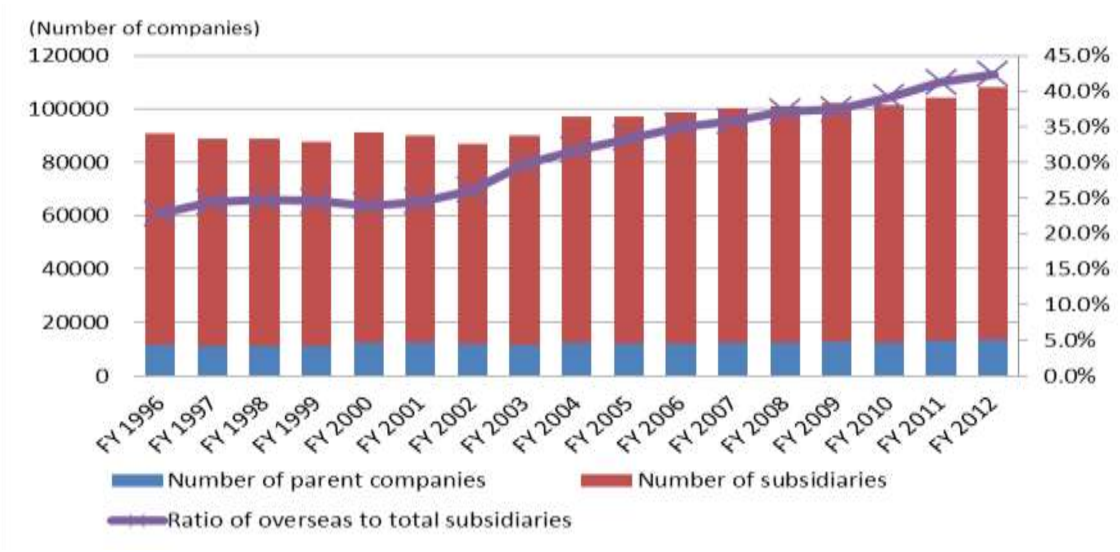
JEL Classification: G34, L21, L25, M52

1. Introduction

Given the recent growing awareness of the need to manage a multiple-unit business group on a consolidated basis and improve the corporate value of the corporate group as a whole, an increasing number of Japanese companies are carrying out consolidated management of their respective corporate groups, which stretch globally and cross national boundaries. The Ministry of Economy, Trade, and Industry's (METI) *Heisei 25-nen Kigyô Katsudô Kihonchôsa Kakuhô* (Final Report on the Basic Survey of Japanese Business Structure and Activities for 2013) reports that 43.7% of the total companies surveyed as of March 2013 had at least one subsidiary or affiliated company. It seems safe to infer from this that many companies, and not only large ones, in Japan are finding it important to operate their businesses by forming multiple-unit corporate groups.[1] In addition, the fact that the ratio between overseas subsidiaries held by Japanese companies and the total subsidiaries they hold has been increasing year by year reveals that many companies launch overseas subsidiaries when going abroad (see Figure 1). Given also that indices such as the number of segments and the ratio of consolidated to non-consolidated net sales were on the rise in the period from 1990 to 2009 (Hanazaki and Matsushita 2014), establishing subsidiaries will assume a far more important role than at present when firms launch new business undertakings.

Figure 1. The ratio of overseas to total subsidiaries of Japanese companies

[1] After describing the process by which companies opted to form multiple-unit corporate groupings, and identifying the factors that led to the growing importance of the integrated management of corporate groups, Aoki and Miyajima (2011) point out that the performance of subsidiaries is often monitored very leniently and out of proportion to the extent of the authority that is delegated to them. For a more detailed history of the development of the integrated management of multiple-unit corporate groups, see Shimotani (2006; 2009).



Note: The ratio of overseas to total subsidiaries is calculated by [the number of overseas subsidiaries] ÷ [the total number of subsidiaries] × 100.
Source: The author's drawing based on statistics presented in METI, Heisei 25-nen Kigyô Katsudô Kihonchôsa Kakuhô (Final Report on the Basic Survey of Japanese Business Structure and Activities for 2013).

As pointed out by Bolton and Scharfstein (1998), however, the progress of corporate diversification, the path of globalization, and the increase in the number of companies give rise to two levels of agency problems. More specifically, these developments are accompanied by the emergence, in addition to the traditional agency problems between shareholders and the management, of new agency problems between corporate headquarters and the subsidiaries.

As is often pointed out especially with regard to the second set agency problems that firms face when governing subsidiaries. Looked at in terms of management, not a few subsidiaries operated on a financially self-sufficient basis, and are delegated authority to a significant extent so as to allow them to take quick and proper actions on the scene. As shown in Tables 1 and 2, this situation sometimes gives rise to problems in which some subsidiaries either have the power or they are not properly administered by their parent companies so that they are in a position where they can dare to manage their affairs in defiance of their parent company's wishes.[2] A well-known example is the case of an irregular accounting practice that was brought

[2] Aoki and Miyajima (2011) point out that such problems often arise when the parent companies give managers of the subsidiaries too much freedom (i.e., fail to monitor the performance of the subsidiaries sufficiently and proportionately to the degree of the authority that has been delegated to them).

to light at the consolidated overseas subsidiary of Oki Electric Industry Co., Ltd. in Spain, namely, Oki Systems Iberica, s.a.u. The president of the subsidiary was found to have been practicing inappropriate accounting by over-recording accounts receivables. Not only did Oki Electric Industry suffer a net loss of 30.8 billion yen, it also suffered great losses in the wake of the disclosure of the crime, for instance, a steep fall in its share price, and the demotion by two grades in the company's credit rating as a bond issuer.

Table 1. The Number of Irregularities Committed by Domestic Subsidiaries

2003 – 2012 (Year)	Number of cases
Irregularities concerning product liability	35
Irregularities concerning failures to observe the law	39

Note and source: By following the procedure adopted by Osano and Hori (2006), we have selected cases of irregularities committed by listed companies, as reported in the NIKKEI Telecom, concerning product liability or breaches of the law.

Table 2. Cases of Irregularities at Overseas Subsidiaries

Date	Name of parent company	Outline of irregularities
February 2009	Seiko Epson Corporation (Brazil and Mexico)	Three Latin American subsidiaries were found to have been conducting inappropriate accounting practices.
May 2009	Foster Electric Company, Limited (Republic of Korea)	At a consolidated and listed subsidiary, ESTec Corporation in the Republic of Korea, employees were found to have been embezzling proceeds from sales.
October 2010	Hitachi Koki Co., Ltd. (Germany)	At a consolidated overseas subsidiary, inappropriate dealings and accounting practices were found to have been carried out on the president's instructions.
March 2011	Fuji OOZX Inc. (Republic of Korea)	At an affiliate, which used the equity method of accounting, the president, who was also the CEO, was found to have misappropriated funds.
May 2012	TADANO Ltd. (USA)	The executive vice-president of a consolidated American subsidiary made use of his status as chief officer in charge of legal affairs by pocketing millions through the inappropriate padding of lawyers' bills and by getting the company to pay these bills to a phantom law firm.
August 2012	Oki Electric Industry Co., Ltd. (Spain)	At the overseas consolidated subsidiary, the president and others were found to have been engaged in inappropriate accounting practices, such as the over recording of sales and accounts receivables (thus disguising the uncollectable accounts receivables), and failure to record borrowings.

Note: Tabulated on the basis of Matsuzawa and Ôta (2012) and various published data.

As is evident from Tables 1 and 2, there are many irregularities by subsidiaries both inside Japan and abroad. Cases of reckless conduct by an overseas subsidiary, as in the case of Oki

Electric Industry, can often result in the parent company's suffering from an extended period of poor performance, the de-listing of the its stocks, or even from the bankruptcy. These incidents seem to imply that the governance of subsidiaries is becoming increasingly important in the management of multiple-unit business groups.[3]

This paper is interested in the scheme of granting stock options by the parent company to subsidiaries' executives – a scheme that became viable with the amendments to the Commercial Code in 2001 – as a potential means of solving these problems. More specifically, this paper examines whether the granting of stock options to these executives by the parent company can work as an incentive to encourage these executives to manage their subsidiaries in such a way as to improve the performance of the corporate group as a whole and thus can help to resolve problems regarding the management structure between the parent and its subsidiaries.

2. Existing Studies

This section describes, on the basis of the findings of existing studies, the relationship between the governance of subsidiaries and the use of stock option schemes, and outlines the significance of the present study.

A parent company is often prompted to establish a subsidiary in the expectation that the latter will be able to respond to changes in the environment surrounding the subsidiary more competently and quickly than it can. In order to take full advantage of such potential, the parent company must delegate authority to the subsidiary so as to enable it to decide and act autonomously about issues such as the planning of its business operations and the employment of its staff but this delegation of authority inevitably raises the question of whether it is necessary to monitor the subsidiary's performance. Itoh, Kikutani, and Hayashida (2008) investigate the means parent companies use to govern their subsidiaries. They were especially interested in finding out whether the intensity of the parent company's monitoring of the performance of a subsidiary is complementary to or supplementary to the subsidiary's accountability regarding its performance. Based on their empirical findings, they conclude that in cases where parent companies delegate authority to their subsidiaries, make the latter accountable for their performance, and increase the intensity of their monitoring of the latter's performance, the performance of the corporate group as a whole is improved. In other words, their findings suggest that in order to improve the performance of the corporate group as a whole, it is not only necessary for a parent company to delegate authority to its subsidiaries, but

[3] For a detailed discussion of corporate irregularities, see Osano and Hori (2006).

also to intensively monitor their subsidiaries' performance.

Aoki and Miyajima (2011) attempt to analyze both the question of the governance of business units, which has become important with respect to the diversification and globalization of Japanese companies, and the progress made in the formation of multiple-unit business organizations from the standpoint of discovering a relationship between the extent of the authority delegated to the business units, and the intensity of the parent company's monitoring of the performance of those units. Based on their findings, they point out that even though the degree of authority delegated to subsidiaries concerning strategic decision making and personnel management is far in excess of that to in-house organizations (such as business departments and in-house business units), the performance of the subsidiaries is monitored less intensely than the level of authority that has been delegated to them would justify.

In other words, while it is an indispensable prerequisite for the improvement of the performance of the corporate group as a whole to delegate authority to subsidiaries and to govern (or monitor) their performance, subsidiaries are actually not being monitored closely enough. Given that, as pointed out in Section 1 above, insufficient monitoring of subsidiaries has given rise to various problems, it seems necessary to devise and put into effect measures to induce parent companies to practice some form of subsidiary governance.

Bearing all this in mind, this study focuses attention on the possibility of solving the problem by using a stock option scheme as a means of providing incentives to subsidiaries' managers.

A study by Itoh, Kikutani, and Hayashida (2003) points out that when a subsidiary that is not dependent on the parent company and is very capable of negotiating on its own is faced with a choice of whether to invest in a project that is specific to its relationship with the parent company (and that applies only to its deals with the parent company) or to invest in a general and multi-purpose project, it is highly probable that the former project will not be chosen. Put differently, in a situation where the managers of a subsidiary can put the interest of their company or their own interest above the policy dictated to them by the parent company, it is possible that these managers may manage the subsidiary by making decisions on their own regardless of whether those decisions might inflict a loss on the parent company. Given such behavior, the parent company may be well advised to make use of a stock option scheme as a system of compensation that is linked to the performance of the parent company, thereby preventing the subsidiary from committing irregularities and, instead, improving the performance of the corporate group as a whole.

In fact, Sumi, Takeguchi, and Takechi (2012) attempted an empirical analysis that focuses attention on the management of a corporate group, and examined the question of the conflict of interest between a parent and its subsidiaries that was pointed out by Itoh, Kikutani, and

Hayashida (2003). Their research found that the greater the conflict of interest between the parent company and the subsidiary, and the greater the degree of the parent company's dependence on the subsidiary for sales, the greater was the chance for the parent company to grant to the subsidiary an option to purchase the parent company's stocks.

It should be pointed out, however, that Sumi, Takeguchi, and Takechi (2012) did not find out whether the granting of the parent company's stock options to executive officers and other employees of the subsidiary actually had the effect of enhancing the performance of the corporate group as a whole. If one of the purposes of introducing a stock option scheme is to enhance corporate performance, it is necessary to examine whether it actually has the effect of improving corporate performance. The present study, therefore, attempts to make up the deficiency of Sumi, Taeguchi, and Takechi (2012) by examining the effect of granting a parent company's stock options on the performance of the corporate group as a whole.

3. Data Analysis

The dataset on stock option schemes used in this study has been drawn from pieces of information that was disclosed in a timely manner by listed companies in Japan. The procedure usually followed in the issuance of stock options is as follows. After a resolution on the issuance of stock options is adopted by a general meeting of shareholders,[4] the details of the terms and conditions of the issuance of the stock options are determined by a meeting of the board of directors, and the options are then granted. Given this procedure, companies opting to adopt stock option schemes are required to disclose in a timely manner not only such information on the scheme as exists at the initial stage of decision making, such as that regarding decisions made by a meeting of the board of directors to propose the adoption of the scheme to a general meeting of the shareholders, but also additional pieces of information on subsequent decisions regarding the details of the terms and conditions as and when such information becomes available.[5] As a matter of fact, in many cases, only rough outlines of the planned stock option schemes are known at the initial stage of decision-making, and the terms and conditions that are initially planned for the issuance of the stock options can sometimes be revised as deliberation

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[4] When a publicly held company issues an equity warrant through fair issuance, a resolution of a shareholders meeting is not required. However, if such warrants are issued to directors and auditors, a separate resolution of a shareholders meeting on the remuneration for directors and officers is required (Article 361, Companies Act).

[5] See Tokyo Shôken Torihikijo (Tokyo Stock Exchange), "II. Kaisha Jôhô no Tekiji Kaiji Kômokubetsu ni kakawaru Jikô (Jôjô kaisha)" (II. Matters concerning the classification of items of corporate information for timely disclosure (listed companies)), *Fusei Tekiji QA-shû* (Collected Questions and Answers on Unlawful Timely Disclosure).

proceeds. Given this fact, this study has collected data by closely following timely disclosed information up to the point in time when concrete details such as the persons to be granted the stock acquisition rights, the number of shares to be granted, and the exercise prices were determined.[6]

The sample period was set from 2002 to 2006, when the practice of granting stock options to executive officers and other employees of subsidiaries became acceptable, concurrently with the nullification of the method of granting stock options either in the form of the company's own shares or in the form of the preemptive right to subscribe for new shares, and their integration of these two methods into one method of granting in the form of the right to subscribe in advance for new shares.[7] The companies targeted for the study are listed companies that make public their consolidated financial statements (but financial institutions, stock brokerage companies, and insurance companies are excluded). Furthermore, those cases that are not subject to the regulations on timely disclosure, including cases where stock options were granted prior to the initial public offering, are also excluded.

This study is not meant to deal with stock options in general. Instead, it focuses attention on the granting of parent companies' stock options to subsidiaries' executives and other officers. Those granted stock options are broken down into the categories shown in Table 3. As is evident from the table, the directors of the parent companies form by far the largest group of stock option grantees, but 30 to 40% of the directors of the subsidiaries surveyed have also been granted stock options. Figure 2 show the changes over time in the number of parent companies that grant stock options only to members of their own companies, and the number of those that grant stock options to members of both their own companies and to members of their subsidiaries and other affiliated companies. Even though companies in the latter group constitute 20 to 30% less than those of the former group, their numbers are still impressive.

The companies targeted for this study are companies listed on the First Section of the Tokyo Stock Exchange that have at least one subsidiary each. All the data on these targeted companies (such as financial data and data on stocks) have been derived from *NIKKEI NEEDS-Financial Quest*.

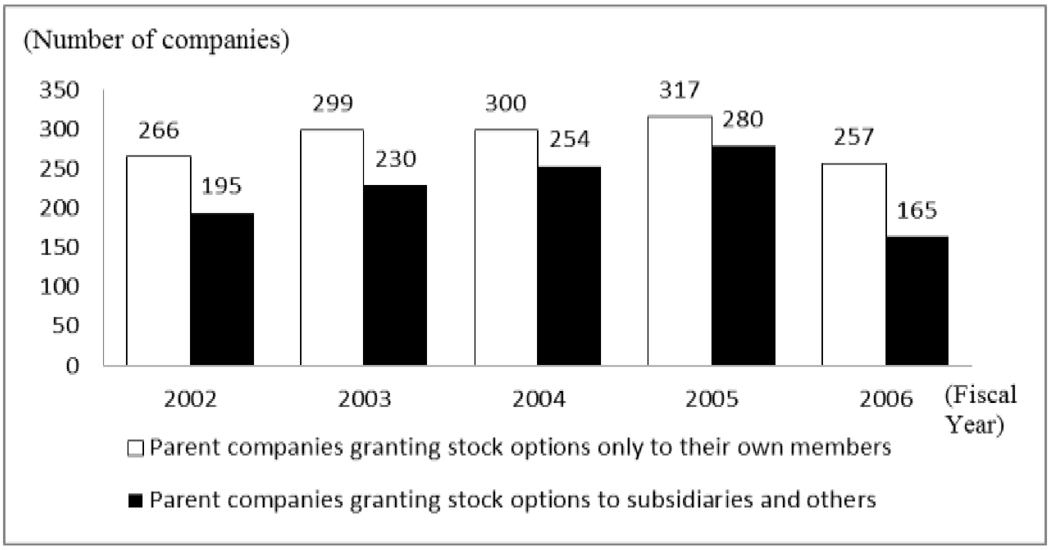
Table 3. Grantees of Stock Options

[6] The dataset used in this study is taken only from those cases where stock options were actually granted and excluded those cases where proposed plans for granting such options, which, though having been timely disclosed at the outset, were later voted down by general meetings of the shareholders, or were otherwise suspended before being actually granted.
[7] However, indices of corporate performance were sampled up to 2009.

	FY2002	FY2003	FY2004	FY2005	FY2006
Directors of the parent company concerned	87.4%	86.0%	82.3%	79.4%	64.8%
Auditors of the parent company concerned	22.4%	31.3%	29.8%	28.8%	21.2%
Executive officers of the parent company concerned	13.2%	17.0%	20.8%	23.4%	20.8%
Employees of the parent company concerned	92.9%	89.0%	86.9%	80.6%	64.3%
Contract employees and other employees of the parent company concerned	3.8%	1.3%	1.4%	0.9%	0.5%
Directors of subsidiaries and others	38.1%	38.8%	41.4%	39.1%	29.6%
Auditors of subsidiaries and others	6.9%	6.0%	7.6%	7.1%	4.6%
Executive officers of subsidiaries and others	1.0%	2.7%	3.8%	4.3%	2.8%
Employees of subsidiaries and other affiliated companies	27.0%	29.2%	28.5%	29.7%	26.3%
Contract employees and other employees of subsidiaries and others	0.6%	0.3%	0.2%	0.3%	0.3%
Trading partners outside the corporate group concerned	3.8%	4.3%	5.5%	7.2%	4.9%

Note1: Each percentage figure represents the number of persons of a specific category who are granted stock options as a percentage of the total number of persons belonging to that category.
Note2: The expression "contract employees and other employees" is an inclusive concept that captures not only "contract employees," but also "commissioned employees," "workers dispatched from temp agencies," "side-job workers," and "persons who have provisionally concluded employment contracts." Furthermore, the expression "subsidiaries and others" is inclusive of subsidiaries and other affiliated companies.

Figure 2. Changes Over Time in the Number of Parent Companies Granting Stock Options



Note: The expression "subsidiaries and others" is inclusive of subsidiaries and other affiliated companies.

4. The Procedure Followed in the Empirical Analysis

In order to determine whether the granting of stock options to executive officers and other members of subsidiary companies has the effect of enhancing the performance of the corporate group as a whole, this paper employs the method of comparing counter samples extracted by means of the propensity score (PS) and propensity score matching (PSM)[8] techniques with the actual corporate performance in the three-year period after the granting of stock options. ROA is used as the index of corporate performance.[9] The procedure adopted is as follows.

First, using a Logit function, the likelihood (i.e., propensity score P_{it}) that the company concerned will grant stock options to executive officers and other members of a subsidiary is estimated as follows:;

$$P_{it} = PROB(Y_{it} = 1 \mid X_{itl}),$$

where the suffix *t* represents the sample period. Since the data used in this study are taken from the five-year period from 2002 to 2006, *t* takes one of the five values, 2002, 2003, …, and 2006. The suffix *i* differentiates between companies that grant stock options to executives and other members of subsidiaries, and those that do not.

X_{itl} is a variable l which is deemed to be the factor that prompts company *i* to grant stock options to executives and other members of subsidiaries in term *t*. Used for variable l are those data used by Sumi, Takeguchi, and Takechi (2012), such as the ratio of intra-group transactions, the ratio of consolidated to non-consolidated net sales, and total assets.[10] $Y_{it} = 1$ or 0 is a dummy variable, which takes the value 1 when company *i* grants stock options to executives and other members of subsidiaries during term *t*, and the value 0 when it does not. By estimating, for each parent company, the propensity score, which is a conditional probability, of the granting of stock options, parent companies are grouped into those that will grant stock options, and those that will not.

Second, the estimated propensity scores are divided into equal-sized strata, and each explanatory variable is checked to see whether it gives rise to insignificant mean variances and satisfies the balancing test. If it is found not to satisfy the balancing test, the formula for estimating propensity scores is modified, and the same procedure is repeated until finally the

8 The technique of propensity score matching is a statistical technique for estimating the "causal effects," which cannot be understood except by experimental or observational studies, and as such, after its introduction by Rosenbaum and Rubin (1983), was developed by Heckman, Ichimura, and Todd (1997; 1998). The technique has recently been used extensively in fields such as medical science and economics. A large number of excellent papers explaining score matching, such as Imbens (2004), Kurosawa (2005), and Caliendo and Kopeinig (2008), are available. Also available are fine texts explaining propensity scores, such as Stock and Watson (2007), Angrist and Pischke (2009), Guo and Fraser (2009), Hoshino (2009), and Wooldridge (2011). It should also be noted that an actual estimation can be performed with the use of various statistical software. For example, in the case of Stata programs, software developed by Becker and Ichino (2002), such as pscore and att*, and that developed by Leuven and Sianesi (2003), such as psmatch2, are widely in use. This study makes various estimations using psmatch2.

9 Given the fact that a large number of companies have lately been using ROA figures to measure the managerial goal to be attained by the corporate group as a whole, it seems appropriate to use ROA as an index of corporate performance.

10 However, variables that do not satisfy the balancing tests (such as the ratio of listed subsidiaries) are not used.

balancing test is satisfied.[11] Subsequently, from out of the companies that are not granting stock options, the five with the highest propensity scores are extracted, and the average scores of these five companies are posited as the counter sample.[12]

Third and finally, corporate performance is compared with the counter sample for three years following the granting of stock options.

5. The Results of the Estimation

The effects of the granting of stock options on corporate performance were estimated with the use of propensity score matching, and the estimated results are presented in the following tables. Table 4 shows that the granting of stock options to executives and other members of subsidiaries has produced statistically significant positive effects on the performance of parent companies when compared to the performance of the counter sample. These effects were ascertained by means of 5-Nearest Neighbor Matching, but much the same results were detected by means of kernel matching.[13] It seems, therefore, quite plausible that as Japanese companies make strenuous efforts to diversify and globalize their operations and to launch multiple-unit corporate business groups, and as they find it increasingly difficult to properly monitor the performance of their subsidiaries, the granting of stock options to executives and other members of subsidiaries is proving effective as a means of providing incentives to the subsidiary companies concerned to become more conscious of the shared interest of member companies in belonging to the corporate group as a whole.

Table 4. The Effect of a Parent Company's Granting of Stock Options to Executives and Other Members of Subsidiaries (measured by ROA)

5-Nearest Neighborhood Matching			
	Companies operating stock option schemes	Companies not operating stock option schemes	t value
t+1	0.067	0.061	2.05*
t+2	0.062	0.054	2.68***
t+3	0.060	0.055	1.78*

11 In order to ascertain whether matching is successful or not, two different tests, namely the Z test and Hotelling's T-square test, are performed. Additionally, this study has improved the precision of matching by imposing a common support condition (i.e., the Minima and Maxima Condition).

12 In this study, an analysis has been made for the case when the counter sample is posited by means of kernel matching.

13 Additionally, similar results were confirmed by means of 10-Nearest Neighbor Matching.

Kernel matching			
	Companies operating stock option schemes	Companies not operating stock option schemes	t value
t+1	0.067	0.055	4.31***
t+2	0.062	0.054	2.92***
t+3	0.060	0.054	2.34**

Note1: By means of propensity score matching, counter samples (i.e., companies not operating stock option schemes) are extracted.
Note2: ***, **, and * respectively indicate that the regression coefficients are statistically significant at 1%, 5%, and 10%, respectively.
Note3: After screening by the balancing test and the common support conditionality, the total number of samples finally used is 279.

Sumi, Taeguchi, and Takechi (2012) found that parent companies with a greater share of subsidiaries are less likely to grant stock options to their subsidiaries. This finding is supported by Table 5 below, in which the sample companies were grouped into those holding shares of subsidiaries at ratios[14] higher than the average ratio and those holding at ratios lower than the average, and the two groups are compared in terms of the effect of the granting of stock options on the performance of the corporate groups as a whole. The estimated results show that in the case of parent companies holding shares of their subsidiaries at ratios lower than the average ratio, the granting of stock options has produced greater and statistically significant positive effects for the three years following the granting compared with the performance of the counter sample. By contrast, in the case of parent companies holding shares of their subsidiaries at ratios higher than the average ratio, the granting of stock options is found to produce a statistically significant positive effect in the first year after the granting. However, in the second and third years after the granting, although their performance remained better than that of the counter sample, the results are not statistically significant.

Table 5. The Effect of the Granting of Stock Options on the Basis of the Ratio of Parent Companies' Shareholdings in their Subsidiaries (measured by ROA)

Kernel matching (Companies with above-average ratios of shareholdings in subsidiaries)			
	Companies operating stock option schemes	Companies not operating stock option schemes	t value

[14] Due to limitations in the data, the ratio of subsidiary companies' shares owned by a parent company is defined in this study as the shares of consolidated subsidiaries of the parent company as a ratio of the total shares of its entire subsidiaries combined (namely, its consolidated subsidiaries, non-consolidated subsidiaries, and affiliated companies).

t+1	0.064	0.057	2.24**
t+2	0.058	0.055	1.59
t+3	0.058	0.056	1.15
Kernel Matching (Companies with below-average ratios of shareholdings in subsidiaries)			
	Companies operating stock option schemes	Companies not operating stock option schemes	t value
t+1	0.071	0.059	4.61***
t+2	0.067	0.055	2.98***
t+3	0.065	0.054	2.68***

Note1: By means of propensity score matching, counter samples (i.e., companies not operating stock option schemes) are extracted.
Note2: ***, **, and * respectively indicate that the regression coefficients are statistically significant at 1%, 5%, and 10%, respectively.
Note3: The total numbers of samples finally used cover 124 companies with above-average ratios of shareholdings in subsidiaries and 155 with below-average ratios of shareholdings in subsidiaries.

On the other hand, the granting of stock options only to members of parent companies did not produce any statistically significant difference from the performance of the counter sample in the three years following the granting (Table 6). This result remained unchanged when examined by various matching methods. As such, it seems to be in agreement with the finding of Hanazaki and Matsushita (2010) that there is a limit to the extent to which a company can enhance its profitability (measured by return on assets (ROA) and return on equity (ROE)) by introducing a stock option scheme.

Table 6. The Effect of a Parent Company's Granting of Stock Options Only to Members of Parent Companies (measured by ROA)

5-Nearest Neighborhood Matching			
	Companies operating stock option schemes	Companies not operating stock option schemes	t value
t+1	0.063	0.063	0.16
t+2	0.058	0.055	1.37
t+3	0.057	0.055	0.97
Kernel matching			
	Companies operating stock option schemes	Companies not operating stock option schemes	t value
t+1	0.063	0.063	0.21

t+2	0.058	0.056	1.25
t+3	0.057	0.056	0.42

Note1: By means of propensity score matching, counter samples (i.e., companies not operating stock option schemes) are extracted.
Note2: After screening by the balancing test and the common support conditionality, the total number of samples finally used is 503.

6. Concluding Remarks

By focusing attention on corporate group management by Japanese companies, this study has analyzed the effects that the granting of stock options by parent companies to executives and other members of their subsidiaries have on the performance of corporate groups as a whole. The estimated results reveal that the granting of stock options to executives and other members of subsidiaries has a positive effect on corporate performance. In particular, the granting of stock options by parent companies with relatively low ratios of shareholdings in subsidiaries can be significantly more effective in enhancing their corporate performance compared with the performance of the counter sample.

These findings reveal that it is effective for parent companies to grant stock options to subsidiaries as a means of providing incentives to the latter in that executives' behavior may then take into account the enhancement of the performance of the corporate group as a whole. Providing subsidiaries with this form of incentive may prove an effective means of easing the problems regarding management structure (such as conflicts of interest and the lack of effective monitoring) between the parent and its subsidiary companies that have been pointed out by existing studies.

One research issue that remains to be addressed is to find out whether the effectiveness of the incentive mechanism differs depending on the number of times stock options are granted to executives and other members of subsidiaries and on the number of shares offered. Furthermore, this study has not dealt with either stock options granted by start-up companies or one-yen stock options. These issues need to be studied meticulously as and when relevant data become available.

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